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(54) Power take-off unit having integral pump mounting flange

(57) A power take-off unit includes a hollow housing 20 having an input shaft 23, an idler shaft 33, and an output shaft 46 supported therein. The input shaft 23 is supported on the housing and carries an input gear 25 thereon that is adapted to be rotatably driven by an engine, transmission, or other source of rotational energy. The idler shaft 33 is supported on the housing and carries an idler gear 35 thereon that meshes with the input gear 25 so as to be rotatably driven thereby. A first end of the output shaft 46 is supported on an inwardly recessed side wall 20e formed integrally with the housing 20. A second end of the output shaft is supported on a bearing cap 43 secured about an opening 42 formed through a second side wall 20c of the housing. A clutch assembly 50 may be provided for selectively connecting the idler gear 35 to the output shaft 46. A mounting flange 51 is formed integrally with the housing 20 about the inwardly recessed side wall 20e and is adapted to facilitate the attachment of the driven accessory directly thereto. The mounting flange 51 may include a flat mounting surface 52 having a pair of apertures 53, 54 formed therethrough. The mounting flange 51 may further include an annular stepped recess 55 extending formed through the inwardly recessed side wall 20e of the housing 20 that functions as a pilot opening to facilitate the mounting of the driven accessory on the housing 20 of the power take-off unit and to insure that the input shaft of the driven accessory is co-axial with the output shaft 46 of the power take-off unit. The housing 20 of the power take-off unit significantly reduces the amount of physical space occupied by the power take-

off unit and the driven accessory, and further enhances the flexibility of positioning the driven accessory relative to the power take-off unit.

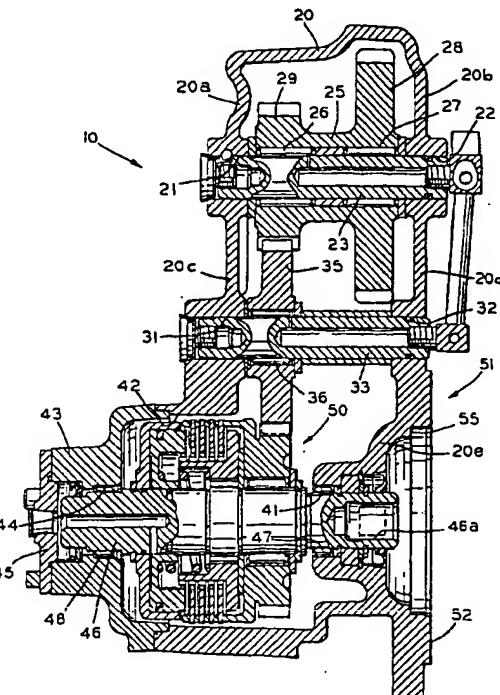


FIG. 4



European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT					
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.6)		
A	US 3 920 109 A (THOMAS DAVID F ET AL) 18 November 1975 (1975-11-18) * column 2, line 30 - line 42 * * column 2, line 63 - column 3, line 4; figure 1 * ---	1-3,6-9	B60K17/28		
A	US 4 573 366 A (KENNARD REED H) 4 March 1986 (1986-03-04) * the whole document * ---	1-3			
A	US 4 773 277 A (COOK RICHARD A ET AL) 27 September 1988 (1988-09-27) * the whole document * -----	1			
			TECHNICAL FIELDS SEARCHED (InIICL6) F16H B60K		
The present search report has been drawn up for all claims					
Place of search	Date of completion of the search	Examiner			
THE HAGUE	7 September 2000	Topp, S			
CATEGORY OF CITED DOCUMENTS					
X : particularly relevant if taken alone	T : theory or principle underlying the invention				
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ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 99 30 1103

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Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 3920109	A	18-11-1975	US	B405938 I	28-01-1975
US 4573366	A	04-03-1986		NONE	
US 4773277	A	27-09-1988		NONE	